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BIOLOGICAL EVALUATION OF SOUTHERN PINE BEETLE ON AIR FORCE TRACT 117, CLAIBORNE GUNNERY RANGE ON THE KISATCHIE NATIONAL FOREST LA,

by

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ABSTRACT

A biological evaluation was conducted on a 223 tree southern pine beetle spot on Air Force Tract 117, Claiborne Gunnery Range located on the Evangeline Ranger District of the Kisatchie National Forest during October 1982. The infestation demonstrated signs of rapid expansion toward managed National Forest timber stands. Therefore, Forest Pest Management recommends that the spot be suppressed by salvage removal as soon as possible.

INTRODUCTION

On October 1 1982, a biological evaluation was conducted on Air Force Tract 117 of the Claiborne Gunnery Range located within the Evangeline Ranger District, Kisatchie National Forest, southwest of Alexandria, LA (figure 1). The purpose of the evaluation was to determine the status of a southern pine beetle *(Dendroctonus frontalis* Zimm.) infestation.

Air Force Tract 117 contains 40 acres of 30 year old loblolly pine and appears to be an abandoned agricultural field which naturally regenerated. In January 1982 a severe ice storm damaged an area of pine within the tract. This may have predisposed the stand to southern pine beetle (SPB) establishment sometime during the early summer. An insect and disease detection flight conducted on September 3, 1982, by the Forest Pest Management Aerial Survey Team located the spot (approximately 30 red and fading trees (Bassett 1982)).

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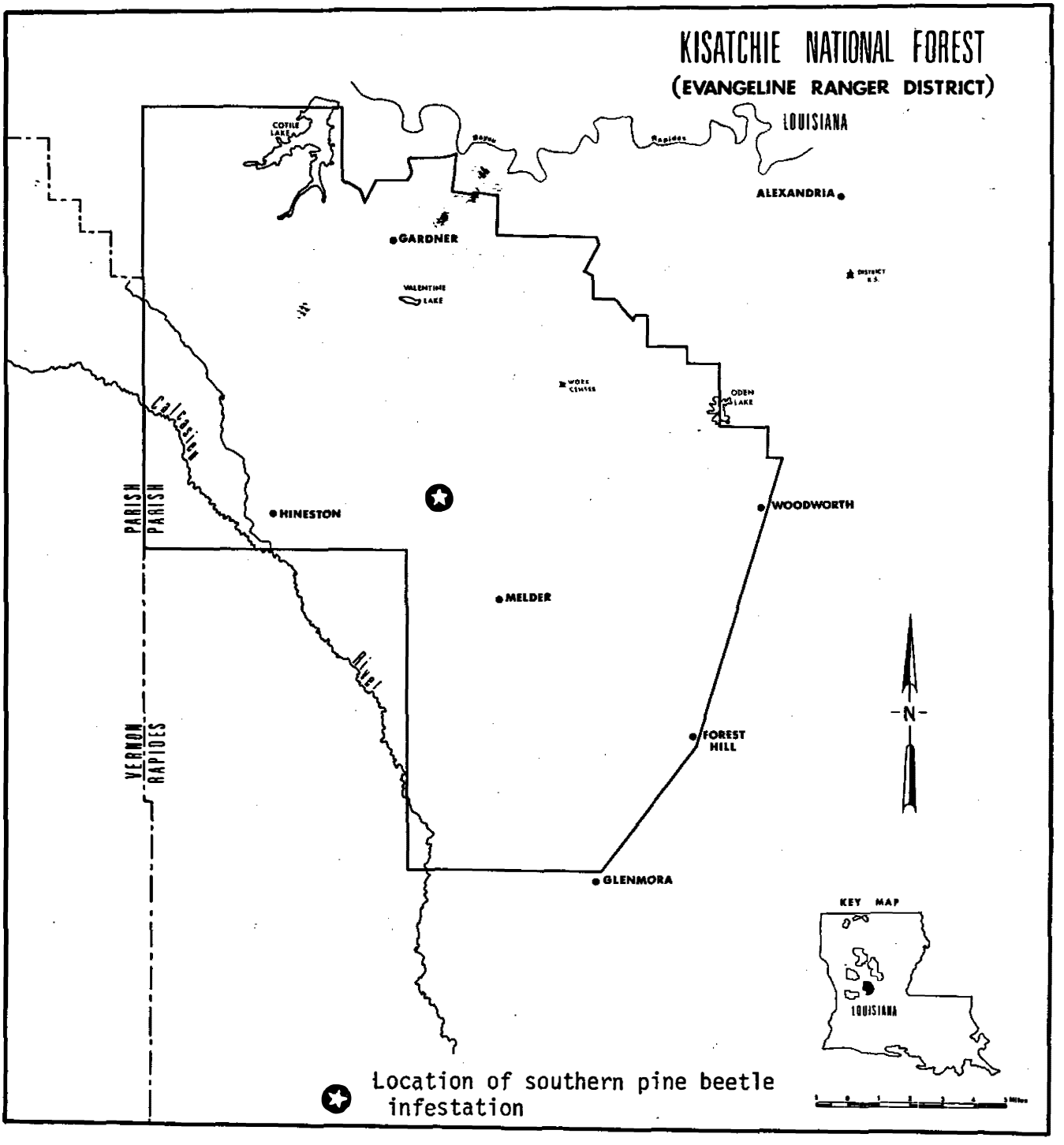

Figure 1. Location of the southern pine beetle infestation on Air Force Tract 117, Claiborne Gunnery Range.

Robert Johnson, Liaison Officer with England Air Force Base who is based on the Evangeline Ranger District, ground checked the spot and found numerous green trees that had recently come under attack by SPB. He also determined that the infestation was spreading toward the Forest Service boundary and threatening a previously marked and sold timber sale. After relaying his concern to Kisatchie National Forest and England Air Force Base personnel, Forest Pest Management was contacted and entomologists from the Alexandria, LA, Field Office conducted the evaluation.

TECHNICAL INFORMATION

Southern pine beetle attacks all species of southern yellow pine. On the Kisatchie National Forest, loblolly pine, Pinus taeda L., and shortleaf pine, Pinus echinata Mill., are the preferred hosts.

Type of Damage - Damage caused by the southern pine beetle is tree mortality resulting from adult beetles constructing egg galleries in the cambial region of the host trees. Blue-staining fungi (Ceratocystis spp.), introduced by the beetles and secondary insects, accelerate the kill by blocking the vascular system of the tree.

Life Cycle of the Insect - The beetles attack and construct winding S-shaped egg galleries in the cambium. Eggs are deposited along the galleries. White larvae hatch from the eggs and further mine the cambium and then construct pupal cells in the outer bark. After transforming to adults, the beetles emerge. During the warmer months, the life cycle is completed in about 30 days. There may be as many as seven generations each year.

METHOD OF EVALUATION

The SPB spot had been previously located by ranger district personnel. During the ground check procedure, the number of SPB infested and vacated trees, basal area, tree diameter, height, and age were recorded.

RESULTS AND DISCUSSION

The results from the ground check are summarized in table 1. The infestation contained 89 vacated and 123 actively infested loblolly poletimber sized trees. It originated in the ice damaged area. The pine basal area at this point was 200 square feet/acre. The spot was also spreading to the north and the active head is only 3 chains from Evangeline Ranger District Compartment 352. The pine basal area at the head of the spot was 160 square feet/acre indicating that there is satisfactory quantity and quality host material available for continued spot spread. The high (19:1) green infested tree:red infested tree ratio is another sign that the infestation was rapidly expanding.

Table 1. Summary of SPB ground check data for Air Force Tract 117, October 1982.

Total No. Trees	No. Infested Trees			No. Vacated Trees				% Infested	Green:Red Ratio[a/]	Average Tree DBH	Age	Site Index	Pine Basal Area
	Total	Green	Red	Total	Green	Red	Black						
212	123	117	6	89	3	52	34	58	19:1	9	32	100	160

[a/] Based on the number of green infested trees:red infested trees.

No SPB spot growth predictions have been made since they were developed for summer months when spot expansion occurs. In the Gulf Coastal Plain, during the fall and early winter, spot expansion slows down and beetles often leave large spots to infest single trees scattered throughout the forest.

RECOMMENDATIONS

Listed below are viable options for dealing with SPB infestations on Air Force Tract 117. These are primarily based on Agriculture Handbook No. 575 (Swain and Remion 1981).

Alternative 1. Remove trees through salvage.

Salvage is the method most often used for stopping the growth of existing spots. This strategy involves removing a buffer strip of noninfested trees, all green infested and red infested trees, and if desired, the trees already killed by the beetles. Removing uninfested material is not needed for successful control even though it may be operationally desirable. The buffer strip should surround the recently attacked trees. It should be 40 to 70 feet wide for most active spots, while a 100-ft strip (and occasionally larger) may be needed for large, rapidly expanding spots. As a rule, the width of the buffer should not exceed the average height of the trees in the spot. The SPB spot should be carefully surveyed and all trees to be removed should be marked.

To implement this alternative the buffer strip should be cut first. All infested trees should then be cut. Vacated trees are cut last and are removed only for utilization purposes. All trees should be felled toward the center of the spot. The reason for this is to keep infested trees as far away from noninfested trees as possible. This reduces the chance of beetles killing additional trees.

Alternative 2. Piling and burning.

Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly charring the bark of infested trees. The entire bark surface must be thoroughly charred to insure effective control. The order of priority for cutting, piling, and burning infested trees, particularly in large spots, is the same for Alternative 1. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts", every effort should be made to locate and treat all green infested trees during the piling and burning operation.

Alternative 3. Cut-and-leave infested trees.

This is accomplished by felling a buffer strip and all infested trees toward the center of the spot. The purpose is to stop spot growth.

Use of this method causes beetles to disperse at a time of year when this behavior is unnatural. This results in a reduction of mass attacked trees and spot growth ceases. Cut-and-leave should only be used in the summer (May 1 - September 30), since these are the only months beetles are not dispersing. It should only be used on small spots, normally 50 infested trees or less.

If spots are greater than 50 infested trees cut-and-leave could be used, but these areas should be monitored biweekly for at least 2 months to insure that a breakout does not occur.

Alternative 4. Chemically treat infested trees.

In this method, infested trees are felled toward the center of the spot, cut into workable lengths, and sprayed with lindane or Dursban 4E. The purpose of this method is to kill the beetle population. To be effective, all bark surfaces must be sprayed. This involves turning the logs which becomes more difficult as tree size increases.

Forest Pest Management, Alexandria Field Office, Pineville, LA, should be contacted prior to the extensive use of chemical control for an update on latest restrictions or application procedures.

Alternative 5. No action.

SPB populations increase periodically. When they increase, large numbers of susceptible pines are killed. This may occur over one to several years, and then the SPB populations collapse and the corresponding pine mortality subsides. This will continue periodically until transition to a climax forest occurs.

Some cutting will have to be done even if this alternative is selected. Dead trees will begin to decay and eventually fall down. Any dead trees along roadsides or in high-use areas should be felled.

FPM suggests that the infestation be suppressed using Alternative 1, salvage removal. This option would quickly remove the trees with developing brood from the area, preventing further spot expansion or proliferation. Cut-and-leave is not a viable alternative due to the time of the year and the No Action alternative would allow the spot to spread to managed timber stands.

REFERENCES

Bassett, R. Aerial detection survey of forest insect and disease activity, Kisatchie National Forest, Louisiana. Rep. No. SA 82-3-45. Doraville, GA: U.S. Department of Agriculture, Forest Service, Forest Pest Management; 1982. 3 p.

Swain, K. M.; Remion, M. C. Southern Pine Beetle Handbook: Direct control methods for the southern pine beetle. U.S. Department of Agriculture Handbook No. 575. Washington, D.C.: U.S. Department of Agriculture, Combined Forest Pest Research and Development Program; 1981. 15 p.

PRECAUTIONARY STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in their original containers under lock and key out of reach of children and animals, and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear appropriate protective clothing.

If your hands become contaminated with a pesticide, wash them immediately with soap and water. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove the clothing immediately and wash skin thoroughly. After handling or spraying pesticides, do not eat or drink until you have washed with soap and water.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicide from equipment, do not use the same equipment for insecticides or fungicides that you used for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary landfill dump, or crush and bury them in a level, isolated place.

NOTE: Some states have restrictions on the use of certain pesticides. Check your state and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Environmental Protection Agency, consult your county agent, state extension specialist or FPM to be sure it is still registered for the intended use. For further information or assistance, contact Forest Pest Management, Alexandria Field Office, Pineville, La., 71360, (Telephone: FTS 497-7280, or Commercial 318/473-7280).